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NAVAL POSTGRADUATE SCHOOL

Monterey, California



THESIS

**THE IMPACT OF INCREASED ANTITERRORISM /
FORCE PROTECTION REQUIREMENTS ON SHIPS
OPERATIONS FUNDING**

by

Tim J. Anderson

March 2002

Thesis Advisor:

John E. Muttu

Co-Advisor:

Shu S. Liao

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**THE IMPACT OF INCREASED ANTITERRORISM / FORCE PROTECTION
REQUIREMENTS ON SHIPS OPERATIONS FUNDING**

Tim J. Anderson
Lieutenant, United States Navy
B.S., University of Idaho, 1994

Submitted in partial fulfillment of the
requirements for the degree of

MASTER OF SCIENCE IN MANAGEMENT

from the

**NAVAL POSTGRADUATE SCHOOL
March 2002**

Author: Tim J. Anderson

Approved by: John E. Mutty, Thesis Advisor

Shu S. Liao, Co-Advisor

Douglas A. Brook, Dean
Graduate School of Business and Public Policy

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ABSTRACT

Since the terrorist attack on USS COLE (DDG 67) and more recently the attacks on New York City and the Pentagon, Antiterrorism/Force Protection (AT/FP) requirements have increased dramatically throughout the Department of Defense (DOD). As these requirements escalate in scope and number, so do the costs of meeting them. In the Navy, ships are bearing a portion of these costs out of their operations funding.

Type Commanders (TYCOMs) fund the operations of all ships and squadrons under their command. In order to have a firm grasp on how these new AT/FP requirements will affect them financially, they must be able to forecast the costs related to them and make appropriate adjustments to their existing ships operations funding model. Acquiring a better grasp on the fiscal impacts of these new requirements will allow Type Commanders to more effectively budget for them in the future. This thesis provides a shipboard AT/FP cost estimation model to aid in forecasting costs associated with these activities.

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I. INTRODUCTION

A. PREFACE

This thesis explores the rising costs of Antiterrorism/Force Protection (AT/FP) in the United States Navy. In today's defense budget environment, meeting the costs of these escalating requirements is a daunting task. AT/FP requirements being placed upon ships and shore installations amount to much more than just an "increased awareness" of the terrorist threat. New equipment must be purchased and distributed, new training must be developed, scheduled and attended, and the list goes on. The Department of Defense (DOD) has redefined the very nature of what "Force Protection" means.

In the Navy, Type Commanders (TYCOMs) fund the operations of all ships under their command. They must forecast operational costs and budget for them. The costs of meeting the escalating nature of AT/FP requirements placed upon ships makes this an inherently more difficult and complex task. While the TYCOM is not responsible for funding all of these new requirements, he is responsible for a portion of them. His ability to capture, forecast and analyze the nature of these rising costs will become increasingly important as he attempts to accurately budget for them.

Ships operations funding includes separate accounts for the following shipboard cost pools:

- Temporary Assigned Duty (TAD) – used to cover the costs of sending crewmembers away for training, for instance
- Repair Parts – for the repair of equipment, and parts used while performing routine maintenance
- Other – "consumable" dollars the ship uses for office supplies, cleaning equipment and the like
- Utilities – electrical power, sewage removal, and potable (fresh) water
- Fuel – consumed by the ship's main engines, electric generators, and small boats

The TYCOM also funds Squadron Commanders under his purview, allocating funds into Other and TAD cost pools. Additionally, a new fund code (funding code second position "L") [Ref. 1] was created and promulgated in September 2001 in an effort to more accurately capture and track AT/FP costs. Atlantic and Pacific Fleet ships,

squadrons, training activities and maintenance activities are to use this funding code for all AT/FP-related costs, from additional fuel for small boat patrols around the ship while at anchor, to TAD costs associated with sending crewmembers to AT/FP training, to repair of AT/FP-related equipment. While response from the fleet has been somewhat inconsistent to date, this is the type of measure TYCOMS are taking in their attempts to capture these myriad costs.

B. RESEARCH OBJECTIVE

The objective of the research presented in this thesis is to help the reader gain a better understanding of the various recent changes in AT/FP requirements, the magnitude of the costs associated with them, and how these costs have grown. Through analysis of these costs, this thesis will examine the feasibility of developing a cost estimation model that may assist the TYCOM in forecasting and budgeting for these costs.

C. RESEARCH QUESTIONS

1. Primary Research Question

Through analysis of limited historical data, can a shipboard AT/FP cost estimation model be developed?

2. Secondary Research Questions

- A.** Does meeting AT/FP funding requirements impact ships operations funding in other areas?
- B.** How will having a better grasp on increasing shipboard AT/FP costs help Type Commanders in their budgeting cycle?
- C.** Do shipboard AT/FP requirement costs vary, and if so, why?

D. SCOPE OF THE THESIS

There have been a wide variety of new AT/FP requirements initiated throughout the Navy since the attack on USS COLE (DDG 67), all with associated costs. Due to constraints on time and in the interest of a workable scope, this thesis will focus on those being placed upon surface ships. Although the analysis presented is based upon data

collected on ships of the Atlantic Fleet (LANTFLT), it is anticipated that the methodology will be applicable to those of other fleets. AT/FP costs incurred by shore installations as a result of meeting increased requirements will be presented and briefly discussed, but will not be included as part of the analysis. Rather, the inclusion of these costs is intended to give the reader a better overall awareness of the types and magnitudes of costs being generated to meet AT/FP requirements today.

E. METHODOLOGY

The methodology used in this thesis consisted of the following steps:

- A comprehensive literature review of pertinent AT/FP instructions, magazine and journal articles, government reports, internet-based materials and other information resources was conducted.
- AT/FP cost data from Commander, Naval Surface Forces Atlantic (CNSL), Commander, Naval Sea Systems Command (COMNAVSEASYSCOM), Commander, Naval Region Northeast (CNRNE), Commander, Naval Region Mid-Atlantic (CNRMA), and Commander, Naval Region Southeast (CNRSE) were collected.
- Telephone interviews with the CNSL comptroller's office, COMNAVSEASYSCOM AT/FP equipment outfitting personnel, and offices of the three Region Commanders mentioned above were conducted in order to develop an understanding of the nature, scope and resulting costs of AT/FP measures currently being required of Atlantic Fleet ships and shore installations.
- An analysis of shipboard AT/FP cost data was conducted to develop a cost estimation tool that may benefit CNSL in forecasting and budgeting for AT/FP costs in the future.
- The shipboard AT/FP costs along with fiscal, logistical and technical considerations were synthesized into a cohesive, comprehensive description of the impact these AT/FP requirements are having on Atlantic Fleet ships.

F. BENEFITS OF RESEARCH

This thesis is intended primarily to benefit TYCOMs attempting to cope with the fiscal challenges of meeting AT/FP requirements. Studies such as this may help TYCOMs to more accurately forecast these costs, enabling them to more effectively budget for them in the future. One possible outcome of this research and analysis is a

modification to the existing ships operations funding model currently in use. The discussion concerning the many facets of AT/FP costs – equipment, training, manpower, port visits, etc. is intended to give readers a more comprehensive view of the various costs incurred by the increase of AT/FP postures throughout the Navy.

II. BACKGROUND

A. AT/FP MISSION ROLES AND RESPONSIBILITIES

The Chairman of the Joint Chiefs of Staff (CJCS) defines Force Protection as a security program designed to protect

Service members, civilian employees, family members, facilities and equipment in all locations and situations, accomplished through planned and integrated application of combating terrorism, physical security, operations security, and personal protective services and supported by intelligence, counter intelligence, law enforcement and other security programs [Ref. 2].

The CJCS promulgated Joint Publication 3-07.2, “Joint Tactics, Techniques, and Procedures for Antiterrorism,” from which the above definition is quoted. The publication sets forth the tactics, techniques, and procedures governing the joint conduct of U.S. antiterrorism operations. It provides a basis for understanding U.S. national policy and general objectives relating to antiterrorism, and explains important DOD and U.S. Government agency command and control relationships. It also outlines basic U.S. military antiterrorism capabilities and provides guidance with respect to organizing, planning, and training for the employment of U.S. forces in interagency and multinational antiterrorism operations.

The DOD is responsible for protecting its own personnel, ships, bases and equipment. Based on these responsibilities, DOD has authored the following guidance:

- DOD Directive 2000.12, “DOD Antiterrorism/Force Protection (AT/FP) Program”

This directive establishes the CJCS as the principal advisor and focal point responsible to the Secretary of Defense (SECDEF) for DOD AT/FP issues, and defines the AT/FP responsibilities of the Military Departments, Commanders of the Combatant Commands, and Defense agencies for DOD activities in their respective organizations. Of note, it tasks the Under Secretary of Defense (Comptroller) with providing information and guidance to DOD components on displaying AT/FP resources within the Planning, Programming, and Budgeting System (PPBS) program and budget submissions.

- DOD Handbook O-2000.12-H, “Protection of DOD Personnel and Activities Against Acts of Terrorism and Political Turbulence”

This handbook builds upon the framework established in Directive 2000.12 and provides installations with detailed information about implementing AT/FP standards and combating terrorist efforts.

- DOD Instruction 2000.16, “DOD Antiterrorism Standards”

This instruction implements AT/FP policy, further assigns responsibilities, and prescribes 31 antiterrorism program standards and procedures under the overarching guidance of 2000.12 for the protection of DOD personnel and assets from acts of terrorism.

Naval TYCOMs have also promulgated guidance for establishing and maintaining AT/FP programs for the Commanders under their purview. Commander, Naval Surface Forces Atlantic (CNSL) and Commander, Naval Surface Forces Pacific (CNSP) have updated guidance in the joint form of Commander Naval Surface Forces (COMNAVSURFOR) Instruction 3300.1, titled “Antiterrorism/Force Protection (AT/FP) Program,” dated 27 January 2002.

This instruction issues policy and procedures for the implementation of AT/FP programs aboard ships, outlining specific guidance in the following areas:

- AT/FP Organization
- Security Forces Afloat and Ship Security Watches
- Qualifications
- Small Arms Proficiency Courses
- Training and Assessments
- AT/FP Planning
- AT/FP Reporting

B. REPORTS ON THE STATUS OF AT/FP READINESS

Many official reports have been published on the status of U.S. military AT/FP readiness. The United States General Accounting Office (GAO) has authored some of the most comprehensive and critical of these. They are summarized here:

- GAO/NSIAD-97-207, “Combating Terrorism: Status of DOD Efforts to Protect Its Forces Overseas” (July 1997)

This report discusses terrorist attacks against U.S. military forces, including that of the Khobar Towers bombing, which killed 19 servicemen on June 25, 1996. It asserts that the DOD lacks a comprehensive, consistent approach to antiterrorism that is based on common guidance, standards, and procedures. It further states that the DOD does not know how much it is spending on antiterrorism because it cannot easily determine what costs are associated with its antiterrorism program. The report also outlines a number of major initiatives DOD has undertaken to improve its program, including policy, organization, and funding changes. The report's recommendations include the adoption of standardized vulnerability assessments, more comprehensive physical security standards, and greater consistency in implementing AT/FP security measures.

- GAO/T-NSIAD-98-44, "Combating Terrorism: Efforts to Protect U.S. Forces in Turkey and the Middle East" (October 1997)

This report focuses on Commanders' efforts to protect personnel overseas, and stresses the fact that because DOD relies heavily on the host nations for many of its security needs, efforts to reduce vulnerabilities often require extensive host nation support. It reiterates the view that DOD still lacks a comprehensive and consistent approach to antiterrorism, and explains the complex security environment facing U.S. forces overseas. It asserts that U.S. forces are constantly exposed to the threat of terrorist attack because executing the national security strategy requires their physical presence in many nations. The report goes into further detail concerning the steps DOD has taken to improve its antiterrorism program, but points out that many vulnerabilities still remain.

- GAO/NSIAD-00-181, "Combating Terrorism: Action Taken But Considerable Risks Remain for Forces Overseas" (July 2000)

This is a follow-up to the above reports. In it, the GAO asserts that limited funding and training have affected the ability of Commanders to correct known vulnerabilities. It points out that the majority of funds used for AT/FP activities come from the services' Operation and Maintenance (O&M) appropriations. Actions the Joint Staff has taken to improve AT/FP programs are explained, as well as those taken by Geographic Combatant Commanders and Shore Installation Commanders. The report discusses several vulnerabilities at

shore installations, and argues that the lack of sufficient funding remains part of the problem. It also states that adequate training for AT/FP personnel is still problematic.

- GAO-01-909, “Combating Terrorism: Actions Needed to Improve DOD Antiterrorism Program Implementation and Management” (September 2001)

This report, written in the wake of the terrorist attack on USS COLE but prior to those on the World Trade Center and the Pentagon, discusses the effectiveness of DOD’s antiterrorism program. It argues that the program’s effectiveness has been limited because DOD has not assessed vulnerabilities at all installations, systematically prioritized resource requirements, and developed a complete assessment of potential threats. It goes on to emphasize that while services and individual installation commanders are taking steps to reduce their vulnerabilities, overall progress is difficult to measure because tracking systems are not in place. It further explains that while DOD is taking steps to improve the antiterrorism program implementation and management to guide program execution and monitor results, limited funding has forced installation commanders to choose between AT/FP and other base operations projects.

Following the terrorist attack on USS COLE, on October 12, 2000, the Secretary of Defense (SECDEF) established a commission to review the attack within the context of DOD policies and procedures. Chaired by General W.W. Crouch, U.S. Army (Retired) and Admiral H.W. Gehman, U.S. Navy (Retired), the commission’s charter was not to assess accountability, but rather to conduct an objective review of the attack. Submitted to SECDEF in January 2001, the commission’s report is comprehensive and focuses on the vulnerabilities associated with in-transit forces. It contains 30 findings and 53 recommendations organized into the areas of Organization, AT/FP, Intelligence, Logistics, and Training. The commission’s report emphasizes that the component commander is the “fulcrum” of the balance that weighs the benefits of engagement against the associated risks and costs. The status of implementing the report’s recommendations is discussed in the next section.

C. CHANGES IN AT/FP POLICY, ORGANIZATION, AND FOCUS

1. Establishment of JCS/J-34

SECDEF assigned CJCS to be his principal advisor on antiterrorism. To support this added responsibility, the Chairman created a new office in the Joint Staff, The Deputy Directorate for Combating Terrorism. Its mission is to

Support the CJCS and assist the Combatant Commands and Services in the execution of their antiterrorism responsibilities across the full spectrum of operations in order to reduce the risk of the terrorist threat to DOD personnel, their families, facilities, and other DOD resources at home and abroad [Ref. 3].

The directorate is organized into three divisions; Plans, Operations, and Programs and Requirements

2. Status of USS COLE Report Recommendations

Since receiving the report from the COLE Commission, DOD has been aggressively implementing the recommendations contained in it. The recommendations were organized into timelines for completion in three, six, nine, and 12-month increments. To date, some 40 of the reports 53 recommendations have been implemented. DOD Directive O-2000.16, "DOD Antiterrorism Standards" codified many of them into policy. Significant actions taken include [Ref. 6]:

- The "Combating Terrorism Readiness Initiative Fund," established by SECDEF and managed by JCS/J-34, was increased from \$15 million to \$28.7 million for fiscal year (FY) 2001, and from \$10 million to \$25 million for FYs 2003-2007. The purpose of the fund is to support emergency, high-priority antiterrorism requirements not funded by the services.
- Overall antiterrorism funding for FY 2001 was increased by \$100 million to \$3.5 billion. This increase in funding reflects the importance DOD is placing on meeting AT/FP requirement costs.
- AT/FP plans with complete listings of site-specific measures linked to Force Protection Conditions are to be classified.
- AT/FP threat assessments are now required at least annually.
- Combatant and Component Commanders are incorporating greater flexibility and more logistics options when scheduling missions.
- The Joint Staff is dedicating additional resources to improve AT/FP training, including more comprehensive unit pre-deployment and recurring training curriculums.

3. Improvements in Shipboard AT/FP Equipment

NAVSEASYSKOM, in a joint effort with CNSL and CNSP, has developed and promulgated an AT/FP Allowance Equipage List (AEL) for every ship in the Navy. Comprised of more than two-dozen separate line items, ships are now receiving AT/FP gear they had not in the past. In addition, Battle Group deployers receive an “augment package” of equipment designed to complement that provided by the AEL. At the time of this writing, the AEL and augment package were under review for consolidation.

4. Manpower and Training

In his guidance for 2002 titled “Fight And Win!” the Chief of Naval Operations (CNO) states that the Navy will

Increase the number of force protection-related professionals in the fleet (Master at Arms, Explosive Ordnance Disposal, Security Force, etc.) from 9,800 today to nearly 13,000 by the end of FY02, working towards a goal of nearly 17,000 by 2007, easing the burden on other Sailors. [Ref. 4]

Additionally, he tasks senior leaders to simultaneously invest in technologies that will increase the effectiveness of this investment in manpower. He calls for a review and adjustment of the rules of engagement for defending against terrorists and measures to integrate and standardize the employment of force protection personnel to ensure uniform practices at home and overseas.

New AT/FP training has been developed and organized into four levels, to encompass virtually every member of the Navy. With target audiences from recruits to senior officers, this new thrust in training is designed to increase awareness and capability throughout the Armed Forces.

5. Funding

The Department of the Navy (DON) received \$33 million from its FY01 Congressional Supplemental request. \$22 million of this was allotted to the Navy, the remaining \$11 million to the Marine Corps. A large portion (\$7.6 million) of the Navy’s allowance went to fund the AEL mentioned earlier. In its justification to Congress, the Navy cited the funds

Address emergent antiterrorism and Force Protection requirements and will substantially mitigate recently recognized Force Protection vulnerabilities. The attack on USS COLE triggered DOD to conduct

comprehensive reassessments of its antiterrorism and Force Protection posture [Ref. 5].

For FY02, the Office of the Secretary of Defense (OSD) increased AT/FP funding via Program Budget Decision 810 by \$284 million for the Navy: (Operations and Maintenance (O&M)-\$86 million, Other Procurement Navy (OPN)-\$178 million, Research and Development (R&D)-\$20 million). Other services also received increased funding, totaling \$255 million [Ref. 6].

6. U. S. Coast Guard Assistance

In his guidance for 2002, the CNO tasked senior leaders to partner with the United States Coast Guard (USCG) and other Federal agencies to strengthen maritime intelligence, and to develop courses of action to reduce vulnerability. In November 2001, Commander in Chief of the Atlantic Fleet (CINCLANTFLT), in a joint announcement with the Commander of the Coast Guard Atlantic Area, stated that four Cyclone-Class Coastal Patrol (PC) ships were being assigned in support of homeland security operation NOBLE EAGLE. Two additional PCs are to be assigned to the Pacific Coast. The ships are to be used for coastal patrol and interdiction efforts with the USCG.

The six PCs will be under tactical control of Coast Guard Area Commanders, while operational control will rest with Atlantic and Pacific Fleet Navy commands. The PCs will continue to be manned and operated by Navy crews, but a team of specially trained Coast Guard law enforcement personnel will deploy on each of them while on maritime homeland security patrol to conduct boardings of vessels at sea, prior to the vessel's entry into a U.S. port. The PCs are also to be used to provide AT/FP for Naval ships, and escort commercial vessels in and out of U.S. ports [Ref. 7].

D. CURRENT SHIPS OPERATIONS FUNDING MODEL

The ships operations funding model currently in use by CNSL is a fairly complex formula involving historical dollar costs and "growth" rates. The formula for "Other" Operating Target (OPTAR) is presented below for illustrative purposes. Those used for repair parts and utilities are the same, however the "price growth" rates differ slightly for each.

$$\text{FY(n) Other OPTAR} = \left(\begin{array}{c} \text{FY(n)} \\ \text{Base Total} \\ \text{Requirement} \end{array} \right) - \left(\begin{array}{c} \text{FY(n)} \\ \text{MTIS} \\ \text{Savings} \end{array} \right) + \left(\begin{array}{c} \text{FY(n)} \\ \text{Incremental} \\ \text{Requirement} \end{array} \right)$$

Where

$$\text{FY(n) Base Total Requirement} = \left(\begin{array}{c} \text{FY(n-1)} \\ \text{to FY(n)} \\ \text{Price Growth} \end{array} \right) \times \left(\begin{array}{c} \text{FY(n)} \\ \text{Ship Years} \end{array} \right) \times \left(\begin{array}{c} \text{3-Year} \\ \text{Average} \\ \text{FY(n-1)} \\ \text{Unit Cost} \end{array} \right)$$

FY(n) MTIS Savings = Savings realized as a result of Material Turned-In To Stores (MTIS). For example, if it is determined that a ship needed to carry eight of a certain part as opposed to 12, those extra four parts are turned back into the supply system, for which CNSL receives a “refund.”

FY(n) Incremental Requirement = Additional funds earmarked for specific purchases, and not included in the funding model, such as replacement of Chemical, Biological and Radiological (CBR) medicinal supplies and medical evacuations (MEDEVACs).

FY(n-1) to FY(n) Price Growth = A growth or inflation term. For example, if price growth were 2.7% from FY(n-1) to FY(n), this term would be 102.7%. Some price growth terms used in the model are actually reductions, for instance 99%.

FY(n) Ship Years = The number of ship years for that particular class of ship during FY(n). For instance, if there were 10 “x-class” ships, all of which were expected to be fully operational for the entire fiscal year (n), there would be 10 ship years for “x-class” ships in FY(n).

3-Year Average FY(n-1) Unit Cost = A “weighted” average of the “Other” OPTAR allotted per unit (ship of that particular class) for the previous three FYs, computed at the end of FY(n-1). This term is the arithmetic mean of three terms a, b, and c, which are:

$$\text{Term a:} \left[\left(\begin{array}{c} \text{FY(n-3)} \\ \text{Adjusted} \\ \text{OP-41} \\ \text{Unit Cost} \end{array} \right) \times \left(\begin{array}{c} \text{FY(n-3)} \\ \text{to FY(n-2)} \\ \text{Price Growth} \end{array} \right) \times \left(\begin{array}{c} \text{FY(n-2)} \\ \text{to FY(n-1)} \\ \text{Price Growth} \end{array} \right) \right]$$

$$\text{Term b: } \left[\begin{pmatrix} \text{FY(n-2)} \\ \text{Adjusted} \\ \text{OP-41} \\ \text{Unit Cost} \end{pmatrix} \right] \times \left[\begin{pmatrix} \text{FY(n-2)} \\ \text{to FY(n-1)} \\ \text{Price Growth} \end{pmatrix} \right]$$

$$\text{Term c: } \begin{pmatrix} \text{FY(n-1)} \\ \text{Adjusted} \\ \text{OP-41} \\ \text{Unit Cost} \end{pmatrix}$$

Where

$$\text{FY(n-3) Adjusted OP-41 Unit Cost} = \frac{\begin{pmatrix} \text{FY(n-3)} \\ \text{Total OP-41} \\ \text{Cost} \end{pmatrix} + \begin{pmatrix} \text{FY(n-3)} \\ \text{MTIS} \\ \text{Adjustment} \end{pmatrix}}{\begin{pmatrix} \text{FY(n-3)} \\ \text{Ship Years} \end{pmatrix}}$$

FY(n-3) to FY(n-2) Price Growth = A growth or inflation term.

FY(n-2) to FY(n-1) Price Growth = A growth or inflation term.

FY(n-2) Adjusted OP-41 Unit Cost = Same as above for FY(n-3), using FY(n-2) terms.

FY(n-1) Adjusted OP-41 Unit Cost = Same as above for FY(n-3), using FY(n-1) terms.

FY(n-3) Total OP-41 Cost = The dollar amount of Other OPTAR actually spent for that class of ship for that FY. Calculated at the end of each FY, the OP-41 is a budget exhibit document that CNSL generates.

FY(n-3) MTIS Adjustment = The MTIS savings as described above.

FY(n-3) Ship Years = The number of ship years in FY(n-3) for that particular ship class.

E. SUMMARY

The intent of this chapter was to set the stage and give the reader background information, in order to demonstrate where the services have been with respect to AT/FP, and where the Navy in particular appears to be going. The presentation and discussion of the current ships operations funding model is intended to illustrate and emphasize the

complexity of the budgeting process TYCOMs must undergo when justifying their budget and allocating funds to the ships under their command. The next chapter presents a synthesis of AT/FP-related costs and discusses TYCOM budgetary ramifications.

III. SYNTHESIS OF AT/FP COSTS

A. INTRODUCTION

The costs of providing Force Protection for Naval Forces are large, and rapidly growing. They cover a wide variety of items, and are not always easy to capture for budgeting purposes. The following sections will discuss three areas of AT/FP costs: those incurred by shore installations, by ships during port visits, and for the procurement of shipboard AT/FP equipment. In addition, budgetary ramifications to the TYCOM due to increased Force Protection postures will be discussed.

B. DESCRIPTION OF AT/FP COSTS

1. Shore Installation AT/FP Costs

A wide variety of AT/FP costs are incurred at Naval shore installations. They include items such as equipment, pay, and training for security personnel, fuel and vehicles for increased security patrols, and upgrades to perimeter security measures such as fences and roadblocks. Individual installations fall under the cognizance of a Naval Region Commander, whose duties include serving as the Regional Area Coordinator, providing Base Operations Support (BOS) infrastructure to Naval operating forces, other Naval organizations, and tenant commands. With respect to AT/FP, they establish and revise policy, provide guidance, and establish uniform standards for the safeguarding of personnel, property, and material at the Naval shore installations and activities under their cognizance [Ref. 8].

Figure 3.1 below displays AT/FP cost data from three Naval Regions along the Atlantic Coast: Naval Region Northeast, Naval Region Mid-Atlantic, and Naval Region Southeast [Ref. 9]. In aggregate, the Commanders of these regions compile and report cost data with respect to providing AT/FP collected from 31 Naval bases and support activities under their cognizance.

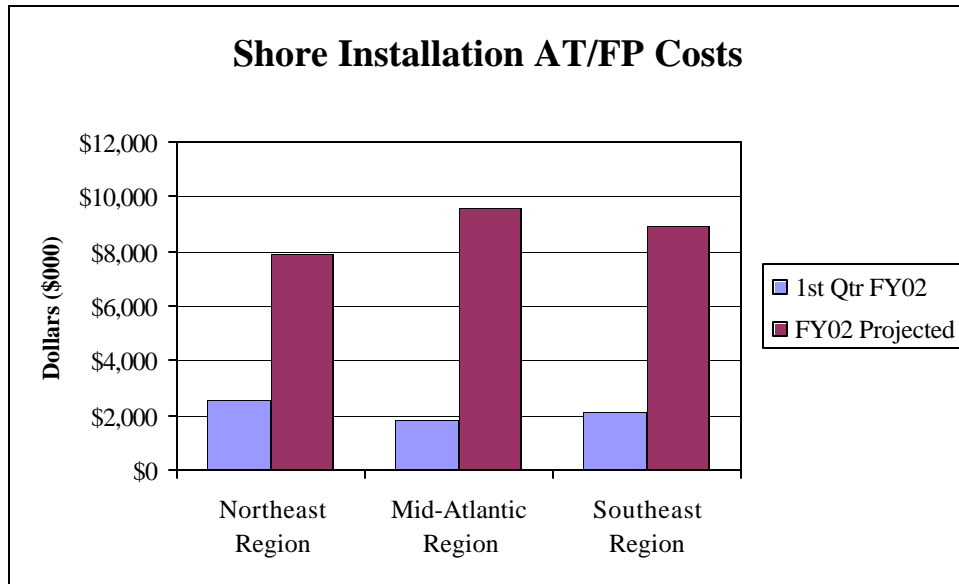


Figure 3.1: FY02 Naval Shore Installation AT/FP Costs

2. Port Visit AT/FP Costs

AT/FP costs incurred by ships during port visits include items such as additional security personnel on the pier or in small boats, perimeter security devices such as fencing or other physical barriers, and additional fuel required for the operation of the ship's boats to secure a perimeter around the ship if at anchor. These costs are paid for with money that comes from the TYCOM's budget. As the Force Protection measures required of ships during port visits grow in number and scope, so do the costs of meeting them. The following graphs illustrate the growing cost of meeting prescribed Force Protection measures for Atlantic Fleet ships during port visits [Ref. 10]. Only those costs relating to Force Protection services provided to the visiting ship are displayed. FY02 figures for the average daily cost and average port visit cost are as of 6 March 2002.

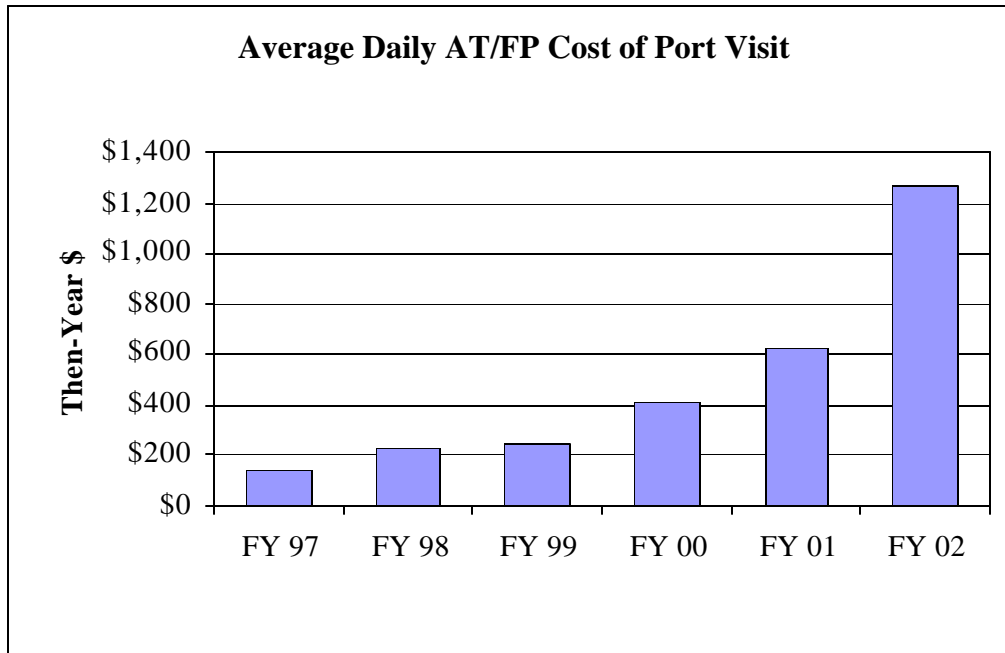


Figure 3.2: Daily AT/FP Services Costs for LANTFLT Ship Port Visits

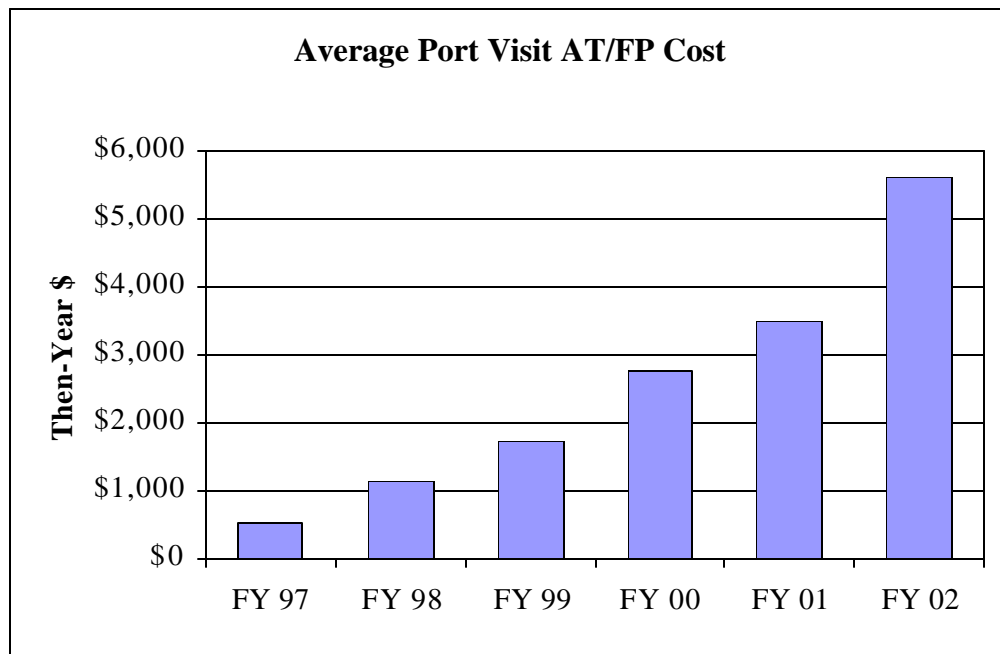


Figure 3.3: AT/FP Services Costs for LANTFLT Ship Port Visits

3. Shipboard AT/FP Equipment Costs

NAVSEASYSYSCOM, working in conjunction with the Naval Criminal Investigative Service (NCIS), developed a shipboard AT/FP equipment AEL in order to outfit ships with needed Force Protection equipment. This AEL (2-320024501, 502, or 503, depending on the class of ship) contains 38 line items and was developed prior to the attack on USS COLE. NAVSEASYSYSCOM received \$12 million to begin the outfitting of all Naval Vessels with the equipment contained in the AEL. Following the COLE attack, NAVSEASYSYSCOM personnel began coordinating with commanders of the Atlantic and Pacific Fleets to develop an augmentation package to the existing AEL. The rationale used in developing the package was to ask the question: “What would a Battle Group or independently deploying ship in a foreign port with no infrastructure need to meet the increased AT/FP requirements?” The result was an augmentation package containing some 23 line items, at an average cost of about \$1.6 million per deploying Battle Group [Ref. 13].

Currently, the AT/FP AEL and augmentation package are under review for consolidation. The consolidated package under consideration contains some 27 individual line items, which ships of each class would receive in differing amounts, based on the size of the ship, crew, and other factors. The total outfitting and distribution cost to the Navy for this equipment is projected to be \$73.8 million [Ref. 14]. Funding for the equipment does not come from ship’s OPTARs, but from NAVSEASYSYSCOM’s initial equipment outfitting account, with contributions from OPNAV Resource Sponsors such as N76 (Surface Ships).

C. BUDGETARY RAMIFICATIONS TO THE TYPE COMMANDER

While the TYCOM is not responsible for shouldering all the myriad costs associated with meeting AT/FP requirements (for instance, he does not pay for AEL items, or those costs incurred by shore installations), he is responsible for many of them. The following paragraphs discuss four significant areas in which the rising cost of Force Protection comes directly out of his budget.

1. “Other” OPTAR and Force Protection Equipment Unfunded

As previously mentioned, “Other” OPTAR refers to funding provided to ships (and their parent squadrons) for consumable goods and services. When a ship exhausts these consumable dollars, it must request an augment from the TYCOM. Although the Force Protection equipment that ships are being outfitted with is enabling them to better provide for their own protection, it is not always enough. When a ship deems some additional equipment is necessary, and the ship cannot afford to purchase the additional equipment it from its “Other” OPTAR, and other funding is not available, it is called an “unfunded requirement.” Figure 3.4 below displays Force Protection equipment unfunded requirements for LANTFLT ships for FY02, as of December 2001. The AUXILIARY group contains the AGF, AOE, and ARS ship classes. The Cruiser-Destroyer (CRUDES) group contains CG, DD, DDG, and FFG classes. LCC, LHA, LHD, LPD, and LSD classes are encompassed by the AMPHIB group, while MCM, MHC, and PC classes make up the MINE WAR group. The PC class was included in this group because its size and manning most closely resembles ships of this group. The graph represents data from active as well as Naval Reserve Force (NRF) ships [Ref. 11].

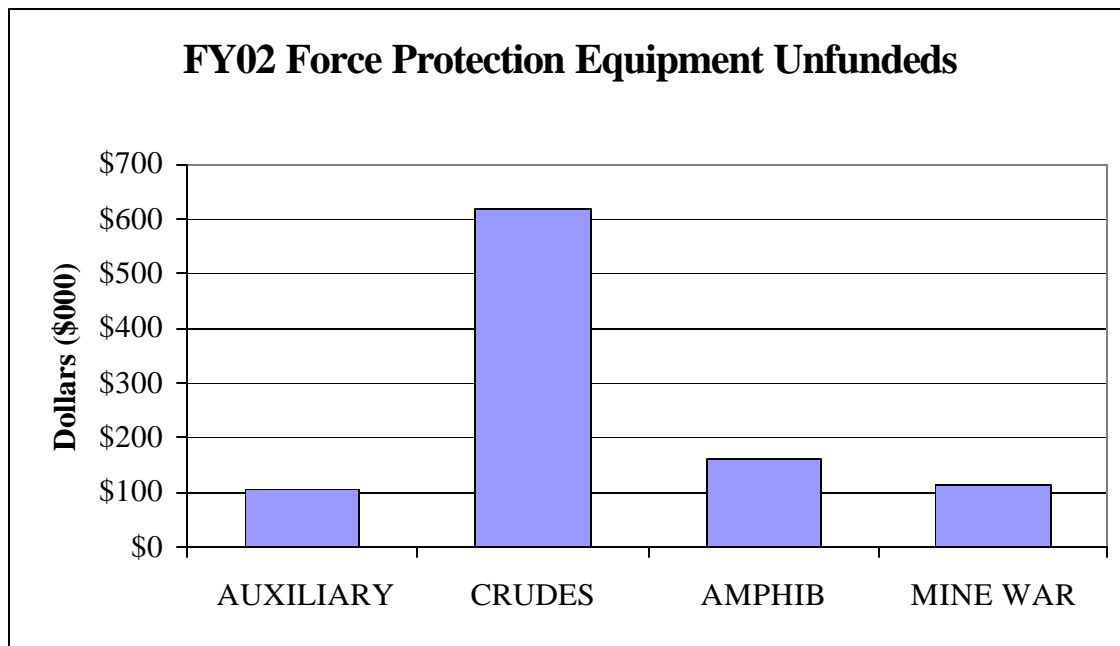


Figure 3.4: FY02 LANTFLT Force Protection Equipment Unfunded

2. Increased Use Of Ship's Assets For Force Protection

While the Force Protection AEL provided ships with additional equipment at no cost to the ship or the TYCOM, existing shipboard equipment is being used at an increased tempo to meet Force Protection requirements. An example is the ship's Rigid Hull Inflatable Boat (RHIB). These small, diesel-powered boats are being operated at increased rates to patrol security perimeters around the ship while at anchor. Increased operating hours translate into an increased need for regular maintenance supplies and repair parts. Ships pay for these repair parts and maintenance supplies with dollars allotted them by the TYCOM.

3. Increased TAD Funding Requirements

In conjunction with the need for additional AT/FP equipment, additional training is required to enable Sailors to use it effectively. Ships send crewmembers to training, which is generally of no cost to the ship. However, the cost of transportation, lodging and meals for these shipboard teams as they attend the training is not. If the training is not offered at the ship's homeport, the ship must bear these costs out of their TAD account. Additionally, the ship's parent squadron is required to inspect and certify the readiness of the Security Teams of each of the ships under its cognizance. The squadron and its ships are not necessarily co-located in the same homeport. For instance, The squadron headquarters may be located in Norfolk, Virginia, while some of its ships are homeported in Mayport, Florida, or Pascagoula, Mississippi. While squadrons are allotted some amount of funding for this, the rising costs of TAD to meet increased AT/FP training requirements remains a concern for the TYCOM.

4. Phased Replacement of AT/FP Equipment

As mentioned before, AT/FP equipment is provided to ships at no cost to them or the TYCOM. However, once the equipment wears out, breaks down or is expended, it is the responsibility of the ship to replace it – this is known as “phased replacement.” The cost of phased replacement of AT/FP equipment is of concern to the TYCOM, because his budget is where the ships under his purview get the dollars to carry it out. While some of the items in the consolidated AT/FP AEL and augment package are inexpensive and fairly robust - \$40 for a waterline security light – others are considerably more expensive, sophisticated, and fragile (\$25,000 for a hand-held explosive detector). This

facet of the cost of providing Force Protection is perhaps of lesser immediate concern than others, but as ships crews use more of the equipment with more regularity, it will become an increasingly important consideration for the TYCOM.

D. SUMMARY

The TYCOM is responsible for a considerable portion of the cost of providing shipboard AT/FP. He must budget for items such as the additional costs of port visits, repair parts and equipment maintenance supplies, TAD for training, and eventually, the phased replacement of equipment. As the TYCOM's AT/FP "bill" grows, funding for other things not AT/FP-related may be reduced, delayed, or even canceled. If care is not taken, whether these "other things" are Quality of Life (QOL) programs for Sailors or additional repair parts for a weapon system, footing the bill for increased Force Protection conditions may have the unintended consequence of adversely affecting the future readiness of our forces.

The next chapter presents a shipboard AT/FP cost estimation model. Component parts as well as limitations of the model are discussed. Based upon analysis of historical and current cost data, the model may help Type Commanders to forecast and thus budget for future shipboard AT/FP requirements.

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IV. SHIPBOARD AT/FP COST ANALYSIS

A. INTRODUCTION

Shipboard Antiterrorism/Force Protection costs are incurred through various requirements. TAD and travel costs are generated by the training requirements for crewmembers. The TYCOM incurs costs for added security measures while ships conduct port visits. Phased replacement of AT/FP equipment generates another set of costs the TYCOM must deal with. The following sections will introduce a shipboard AT/FP cost estimation model, explain its component parts, the results obtained, and limitations of the model.

B. SHIPBOARD AT/FP COST ESTIMATION MODEL

A shipboard AT/FP cost estimation model must attempt to capture the costs mentioned above for a given fiscal year. The cost model can be represented as follows:

$$\text{AT/FP Cost} = \left(\begin{array}{c} \text{AT/FP TAD} \\ \text{and Travel} \\ \text{Costs} \end{array} \right) + \left(\begin{array}{c} \text{Port Visit} \\ \text{AT/FP} \\ \text{Costs} \end{array} \right) + \left(\begin{array}{c} \text{AT/FP Phased} \\ \text{Replacement} \\ \text{Costs} \end{array} \right) + \left(\begin{array}{c} \text{AT/FP} \\ \text{Incremental} \\ \text{Costs} \end{array} \right)$$

1. AT/FP TAD and Travel Costs

This term in the equation captures those costs associated with sending crewmembers off the ship to attend required Force Protection training. It contains funding for travel, lodging and meals while attending this training, the majority of which is conducted at Naval Amphibious Base Little Creek, Virginia. While ships homeported there or at other bases in the Norfolk area may not incur large costs, those generated by ships homeported elsewhere will invariably be much greater. Table 4.1 below summarizes estimated costs for FY02 compiled for LANTFLT ships. These data were provided by the CNSL Comptroller's office and represent estimated costs based on the current training requirements as well as what has been spent to date for AT/FP TAD and travel.

Ship	Number	Class	Per Ship
Class	In Class	Allowance	Allowance
AGF	1	\$11,000	\$11,000
AOE	4	\$17,000	\$4,250
ARS	2	\$2,000	\$1,000
CG	14	\$46,000	\$3,286
DD	11	\$21,000	\$1,909
DDG	19	\$58,000	\$3,053
FFG	20	\$30,000	\$1,500
LCC	1	\$2,000	\$2,000
LHA	2	\$11,000	\$5,500
LHD	4	\$26,000	\$6,500
LPD	5	\$10,000	\$2,000
LSD	7	\$14,000	\$2,000
MCM	14	\$56,000	\$4,000
MCS	1	\$7,000	\$7,000
MHC	12	\$15,000	\$1,250
PC	9	\$13,000	\$1,444
TOTAL		\$339,000	

Table 4.1: Estimated AT/FP TAD and Travel Requirements for LANTFLT Ships

2. Port Visit AT/FP Costs

This term includes those AT/FP costs incurred by ships during port visits. Additional security measures provided to the visiting ship by the host country such as guards, fencing, barriers and floating booms are reflected here. The outfitting of Force Protection allowance equipage list items and the AT/FP training now required of ships may mitigate some of these costs, however, some portion will undoubtedly remain. Data for this term were extracted from the Cost Reporting, Analysis, and Forecasting Tool (CRAFT) database, designed and maintained by Naval Region Contracting Center (NRCC) Naples, Italy. Reports to the database are included in husbanding services contracts in the Navy's Second, Fifth, and Sixth Fleets. A similar database, maintained by NRCC Singapore, includes port visit cost data on the Navy's Third and Seventh Fleets.

Force Protection services cost data for each class of ship in the Atlantic Fleet were compiled for each quarter of fiscal years 1998 through 2001, and for the first quarter of fiscal year 2002. Due to the increased Force Protection requirements following the attack on USS COLE on October 12, 2000, data for fiscal years prior to that (1998 through 2000) were deemed less relevant by the researcher for the purpose of estimating port visit

AT/FP costs in the current Force Protection environment. Table 4.2 below summarizes costs incurred by Atlantic Fleet ships for the four quarters of FY01 and the first quarter of FY02.

Ship	1Q FY01	2Q FY01	3Q FY01	4Q FY01	1Q FY02	FY02
Class	\$ Spent	\$ Spent	\$ Spent	\$ Spent	\$ Spent	Projection
AGF	\$1,729	\$348	\$0	\$0	\$0	\$4,154
AOE	\$0	\$0	\$0	\$3,307	\$2,247	\$11,108
ARS	\$0	\$8,760	\$0	\$20,033	\$0	\$57,586
CG	\$11,304	\$4,060	\$5,978	\$37,567	\$9,121	\$54,424
DD	\$900	\$2,392	\$3,515	\$10,495	\$4,556	\$17,486
DDG	\$0	\$25,871	\$9,841	\$16,173	\$22,709	\$74,594
FFG	\$0	\$7,056	\$10,185	\$30,309	\$47,139	\$94,689
LCC	\$0	\$0	\$0	\$0	\$0	\$0
LHA	\$4,393	\$2,589	\$2,955	\$0	\$0	\$13,249
LHD	\$0	\$186	\$12,903	\$27,886	\$0	\$54,633
LPD	\$0	\$899	\$68,886	\$19,970	\$0	\$119,673
LSD	\$1,075	\$18,663	\$15,093	\$16,326	\$0	\$51,157
MCM	\$0	\$636	\$3,260	\$20,796	\$0	\$32,923
MCS	\$0	\$0	\$4,445	\$0	\$0	\$0
MHC	\$0	\$1,985	\$13,407	\$0	\$0	\$30,784
PC	\$0	\$2,580	\$2,918	\$7,957	\$0	\$17,940
TOTAL	\$19,401	\$76,025	\$153,386	\$210,819	\$85,772	\$634,401

Table 4.2: Port Visit Force Protection Services Costs for LANTFLT Ships

The shaded cells in the AGF (4Q FY01), DDG (3Q FY01), and LPD (3Q FY01) rows indicate periods in which the data were smoothed for analysis purposes. For each of these three ship classes, the Force Protection services cost for a single port visit to Istanbul, Turkey during that timeframe was removed from the data due to its peculiar circumstances. Force Protection services costs for each of these Istanbul port visits were:

- AGF: One ship, four days (9–12 August 2001) at a cost of \$56,900
- DDG: One ship, one day (9 June 2001) at a cost of \$33,000
- LPD: One ship, one day (8 June 2001) at a cost of \$33,000

Though not to be discounted, these Force Protection costs for a single port visit were considered to be atypical by the researcher when compared to the costs incurred by those ship classes in other port visits. The exorbitant nature of these costs skewed the computed average quarterly cost, which in turn resulted in an uncharacteristically high FY02 projection. For this reason, these three data points were removed during the calculation of the average quarterly cost and the FY02 projection.

It is emphasized, however, that these ships did incur the costs outlined above. Ships planning future port visits to Istanbul will incur costs of this magnitude and thus must take them into account. Because they were removed from the data for the calculation of the average quarterly cost as well as the FY02 projection, TYCOMs budgeting for visits to this port will incur much greater Force Protection services costs than the model predicts.

Dividing the dollar amounts spent per quarter for port visit Force Protection services by the number of days spent in port during those visits gives an average daily cost per quarter. The following three graphs represent these average daily costs, computed for the AUXILIARY, CRUDES, and AMPHIB groups. To further illustrate the atypical nature of the costs discussed above, data from Istanbul port visits are included in the graphs.

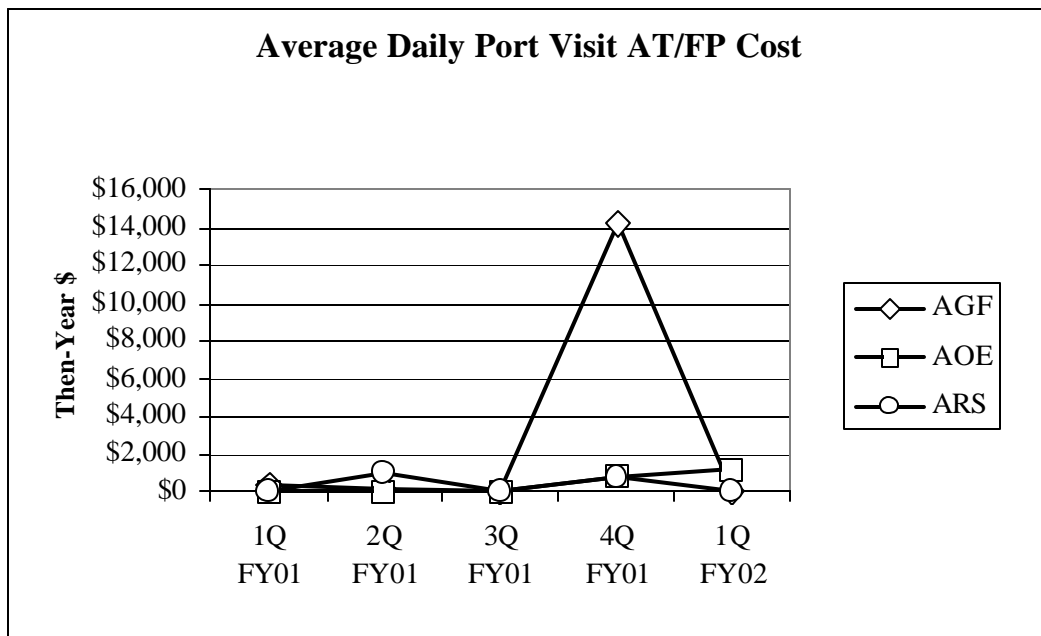


Figure 4.1: Port Visit AT/FP Costs for LANTFLT AUXILIARY, Including AGF Port Visit to Istanbul, Turkey

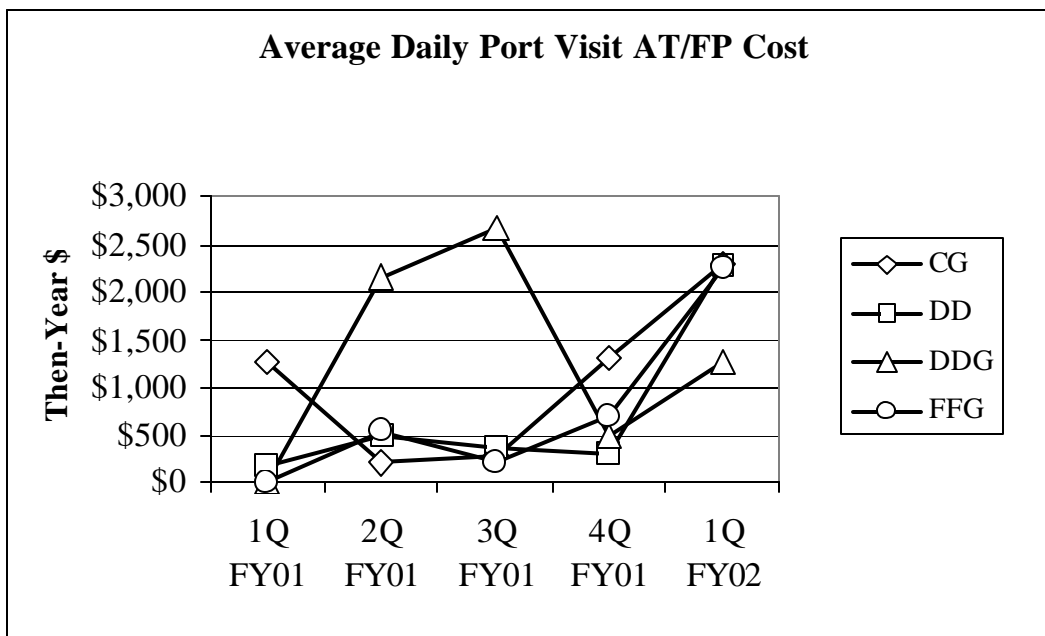


Figure 4.2: Port Visit AT/FP Costs for LANTFLT CRUDES, Including DDG Port Visit to Istanbul, Turkey

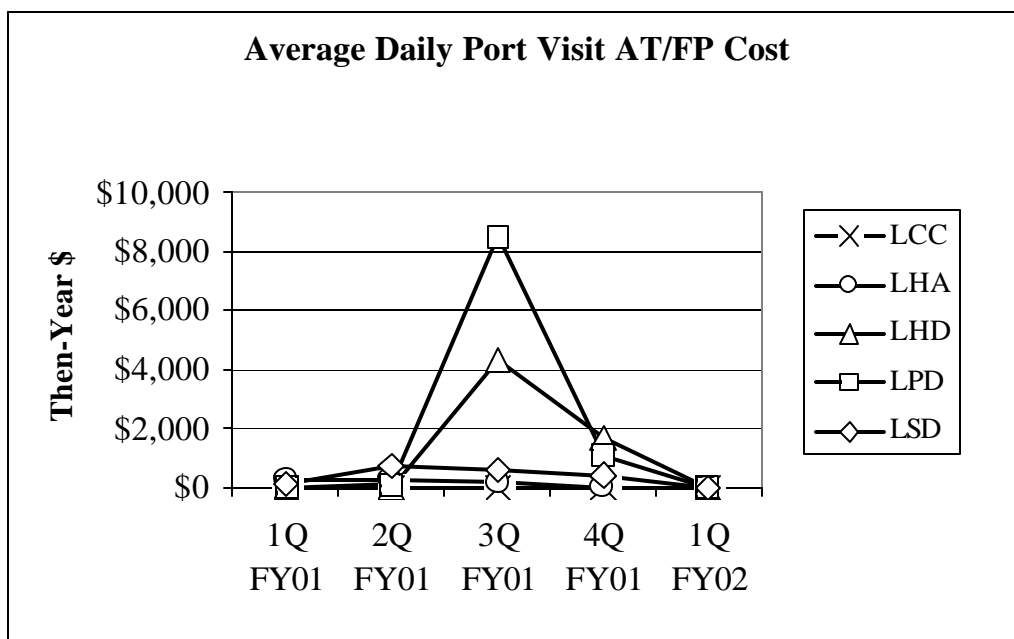


Figure 4.3: Port Visit AT/FP Costs for LANTFLT AMPHIB, Including LPD Port Visit to Istanbul, Turkey

The “FY02 Projection” column in Table 4.2 was formulated by averaging the previous quarters for each ship class (excluding the Istanbul visit data for the reasons described) in order to compute an average quarterly cost, representative for that class of ship. This figure was then multiplied by four to arrive at an estimated cost per class for the entire fiscal year.

Cells in the table containing zeros were treated as missing numbers and were not considered when computing the quarterly averages. This was done to arrive at a more meaningful, representative quarterly average of the AT/FP services costs being incurred during port visits. A zero in Table 4.2 does not necessarily mean no port visits were conducted during that quarter - rather, it simply means that no port visit AT/FP services costs were documented or reported into the database. For example, the four LANTFLT AOE’s conducted 33 port visits for a total of 111 days inport during FY01. Of these, AT/FP services costs were reported into the database for only two of them, for a total of four days inport.

Thus, AT/FP services costs were reported into the database for less than seven percent of the port visits conducted by this ship class. Based on data such as these and conversations with the SURFLANT Force Comptroller, it is the belief of the researcher that not all AT/FP costs being incurred are being reported, or documented in databases such as CRAFT. Due to the limited data available, the port visit AT/FP costs term of the model is likely under-estimated, perhaps even significantly so. For these reasons, zeros appearing in Table 4.2 were treated as missing numbers, and were not considered during the quarterly average calculation. The FY02 projection for the MCS class (a single ship, USS INCHON) is zero because it is to be decommissioned during that timeframe [Ref. 12], and no further port visits are scheduled.

The following graphs represent average daily port visit AT/FP costs, computed for each ship class. In these graphs, the AT/FP costs incurred during the three port visits to Istanbul were removed for the reasons previously discussed, as were the days spent there.

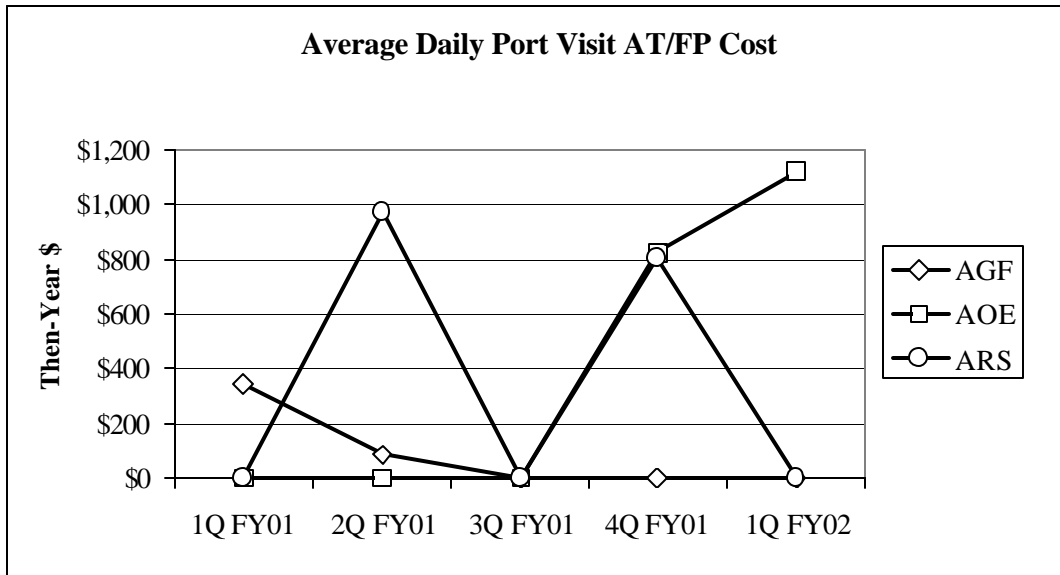


Figure 4.4: Port Visit AT/FP Costs for LANTFLT AUXILIARY, Excluding AGF Port Visit to Istanbul, Turkey

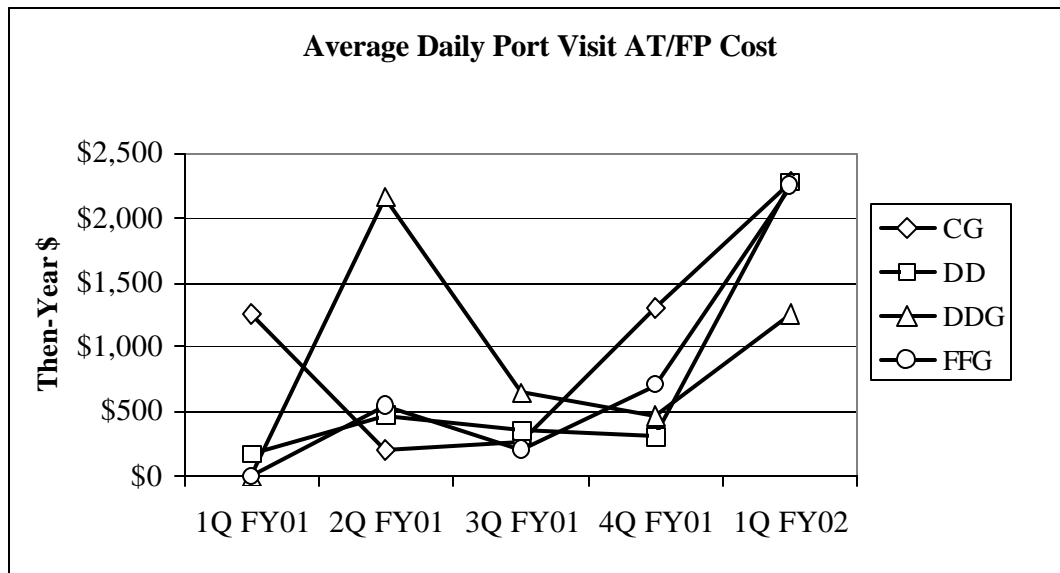


Figure 4.5: Port Visit AT/FP Costs for LANTFLT CRUDES, Excluding DDG Port Visit to Istanbul, Turkey

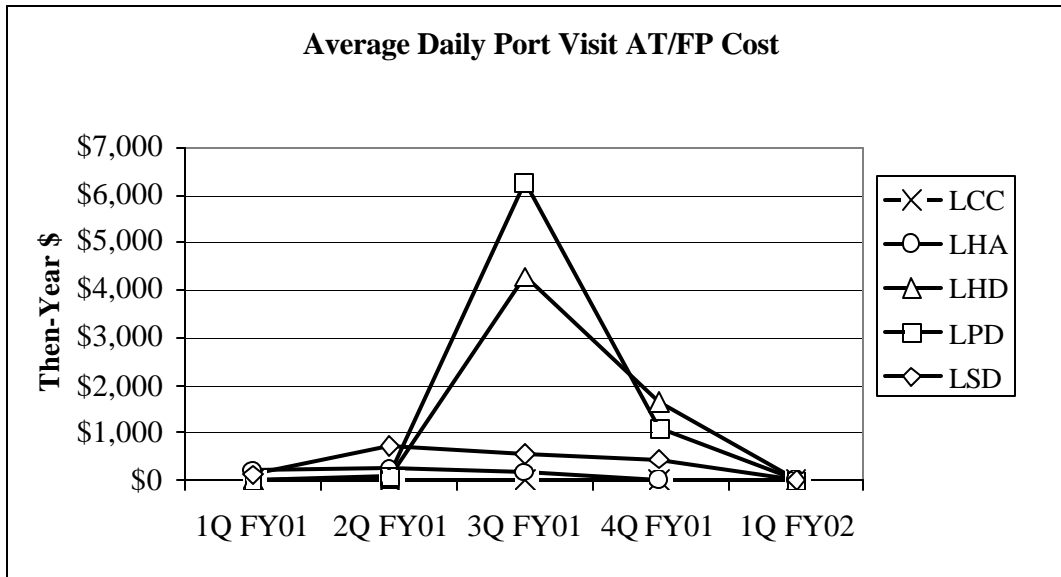


Figure 4.6: Port Visit AT/FP Costs for LANTFLT AMPHIB, Excluding LPD Port Visit to Istanbul, Turkey

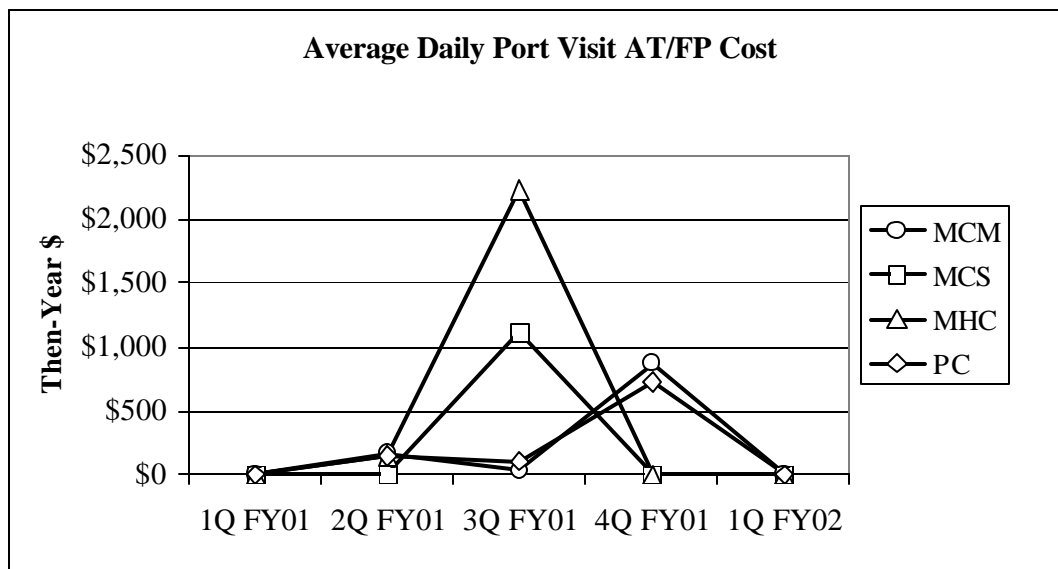


Figure 4.7: Port Visit AT/FP Costs for LANTFLT MINE WAR

3. AT/FP Phased Replacement Costs

This term of the model captures the cost of the phased replacement of equipment contained in the Force Protection AEL being distributed to ships. In order to arrive at a

more refined estimate of these costs, The AEL was divided into “cost groups,” as determined by the researcher, based on the unit cost of each item. When analyzing the unit costs of the items contained in the AEL, they logically fell into four groups as follows: group one contains ten items ranging in cost from \$6 to \$80, group two contains nine items between \$150 and \$570, group three includes five items costing \$2,000 to \$5,675, and group four contains three items ranging in cost from \$12,400 to \$104,500. Each cost group was then assigned an average lifetime based on the researcher’s estimate of the likely shipboard life of the items in that group: two years for group one, four years for group two, six years for group three, and eight years for group four. Finally, the unit cost for the items in each group was multiplied by the quantity of that item assigned to each ship, which was then multiplied by the number of ships in that class. These cost group totals were then divided by the lifetimes assigned to each group, and summed to arrive at an annual phased replacement cost per class. For each ship class, the annual cost was divided by the number of ships in the class to give the annual cost per ship. Table 4.3 below summarizes the results. Annual costs for the MCS class are zero for the reason cited above. The Force Protection AEL and associated item unit costs were provided by NAVSEASYS.COM.

Ship Class	Number In Class	AEL Cost Per Ship	AEL Cost Per Class	Annual Cost Per Ship	Annual Cost Per Class
AGF	1	\$210,641	\$210,641	\$34,531	\$34,531
AOE	4	\$211,307	\$845,229	\$34,676	\$138,705
ARS	2	\$192,694	\$385,387	\$29,834	\$59,667
CG	14	\$210,557	\$2,947,803	\$34,489	\$482,844
DD	11	\$210,557	\$2,316,132	\$34,489	\$379,378
DDG	19	\$210,557	\$4,000,590	\$34,489	\$655,289
FFG	20	\$210,557	\$4,211,148	\$34,489	\$689,778
LCC	1	\$447,116	\$447,116	\$64,825	\$64,825
LHA	2	\$474,633	\$949,265	\$68,531	\$137,063
LHD	4	\$474,633	\$1,898,531	\$68,531	\$274,126
LPD	5	\$446,787	\$2,233,937	\$64,181	\$320,904
LSD	7	\$446,912	\$3,128,386	\$64,243	\$449,703
MCM	14	\$75,684	\$1,059,576	\$11,448	\$160,276
MCS	1	\$179,163	\$179,163	\$0	\$0
MHC	12	\$81,359	\$976,308	\$12,394	\$148,729
PC	9	\$72,276	\$650,484	\$10,447	\$94,021
TOTAL			\$26,439,696		\$4,089,838

Table 4.3: LANTFLT Ship Estimated AT/FP Equipment Phased Replacement Costs

4. AT/FP Incremental Costs

This term is meant to capture those items not included in the previous terms, and to allow for the limitations of the model. It includes AT/FP costs that are incurred, but not budgeted for, so that they may be included in the model for subsequent fiscal years. Likely future items included in this term are:

- Additional repair part and depot level repair dollars expended due to the increased use of existing assets, such as Rigid Hull Inflatable Boats
- Additional fuel requirements due to increased small boat operations
- Additional funding for small arms ammunition, as a result of the increased training required of ship's force

As discussed in Chapter I, use of the new fund code for AT/FP expenditures should help TYCOMs capture these myriad elements for inclusion into this term of the cost estimation model. In developing the model, Force Protection unfunded requirements made up this term. Table 4.4 below summarizes FY02 Force Protection unfundeds as collected by CNSL for the ships under its cognizance.

Ship Class	Number In Class	Unfunded Per Ship	Unfunded Per Class
AGF	1	\$71,847	\$71,847
AOE	4	\$6,025	\$24,100
ARS	2	\$4,474	\$8,948
CG	14	\$11,388	\$159,432
DD	11	\$11,937	\$131,307
DDG	19	\$8,145	\$154,755
FFG	20	\$8,666	\$173,320
LCC	1	\$4,200	\$4,200
LHA	2	\$23,101	\$46,202
LHD	4	\$18,203	\$72,812
LPD	5	\$2,714	\$13,570
LSD	7	\$3,568	\$24,976
MCM	14	\$3,061	\$42,854
MCS	1	\$0	\$0
MHC	12	\$3,841	\$46,092
PC	9	\$3,061	\$27,549
TOTAL			\$1,001,964

Table 4.4: FY02 LANTFLT Ship AT/FP Unfunded Requirements

No data were taken for the MCS class due to its planned decommissioning. Data for the PC class appear in the table, although CNSL was not the cognizant TYCOM at the time

of the data call. MCM class figures were used as what the researcher reasoned was the most likely approximation.

C. COST ESTIMATION MODEL RESULTS

When the four terms of the cost estimation model are combined, a total dollar figure for Force Protection requirements per ship class is obtained. Table 4.5 below summarizes the results.

Ship Class	Number In Class	TAD and Travel	Port Visits	Phased Replacement	Incremental Costs	Class Total	Per Ship Total
AGF	1	\$11,000	\$4,154	\$34,531	\$71,847	\$121,532	\$121,532
AOE	4	\$17,000	\$11,108	\$138,705	\$24,101	\$190,914	\$47,729
ARS	2	\$2,000	\$57,586	\$59,667	\$8,947	\$128,200	\$64,100
CG	14	\$46,000	\$54,424	\$482,844	\$159,438	\$742,706	\$53,050
DD	11	\$21,000	\$17,486	\$379,378	\$131,306	\$549,171	\$49,925
DDG	19	\$58,000	\$74,594	\$655,289	\$154,747	\$942,630	\$49,612
FFG	20	\$30,000	\$94,689	\$689,778	\$173,327	\$987,794	\$49,390
LCC	1	\$2,000	\$0	\$64,825	\$4,200	\$71,025	\$71,025
LHA	2	\$11,000	\$13,249	\$137,063	\$46,201	\$207,513	\$103,757
LHD	4	\$26,000	\$54,633	\$274,126	\$72,812	\$427,571	\$106,893
LPD	5	\$10,000	\$119,673	\$320,904	\$13,568	\$464,145	\$92,829
LSD	7	\$14,000	\$51,157	\$449,703	\$24,974	\$539,834	\$77,119
MCM	14	\$56,000	\$32,923	\$160,276	\$42,853	\$292,051	\$20,861
MCS	1	\$7,000	\$0	\$0	\$0	\$7,000	\$7,000
MHC	12	\$15,000	\$30,784	\$148,729	\$46,091	\$240,604	\$20,050
PC	9	\$13,000	\$17,940	\$94,021	\$27,550	\$152,511	\$16,946
TOTAL		\$339,000	\$634,401	\$4,089,838	\$1,001,962	\$6,065,201	

Table 4.5: Results of the Shipboard AT/FP Cost Estimation Model

As displayed in Table 4.5, the annual cost to CNSL, as predicted by the model, is over \$6 million (had the Istanbul data been included in the port visit term, the amount forecasted by the model would have been \$6.2 million). This is the approximate cost of shipboard AT/FP to be budgeted for. In determining this dollar amount, the model assumes that the number and length of port visits per ship class will remain approximately constant. It also assumes the Force Protection AEL will be fully funded and implemented for all ship classes, and that the phased replacement of this equipment will occur as scheduled by the cost groups the AEL items were placed into. Although the model was designed to capture the major AT/FP cost drivers, it, like all cost estimation

models, has limitations. Factors that will affect the actual dollar amount forecasted by the model include:

- Changes in shipboard operations tempo (OPTEMPO)
- Changes in the number, duration, and geographic location of port visits
- Changes in the number of ships in each class
- Prolonged changes to the Force Protection Condition (FPCON)
- The actual shipboard life of Force Protection AEL items
- When the phased replacement of AEL items begins
- Yearly inflation rates

D. SUMMARY

The cost of shipboard AT/FP is large and difficult to accurately quantify. It encompasses a wide variety of variables, including crew training, security during port visits, and equipment phased replacement. Other costs that are not as easily captured include the additional maintenance and repair due to increased use of existing equipment, additional fuel requirements to allow for increased small boat operations, and the small arms ammunition required for increased shipboard security personnel training. While some of these costs may be easily compiled and calculated, others are more subtle and will require the TYCOMs who must forecast and budget for them to employ innovative techniques to do so.

This chapter has introduced a viable shipboard AT/FP cost estimation model and explained its component parts, as well as its limitations. It was designed to capture the major shipboard AT/FP cost drivers, and cost elements of AT/FP that are more difficult to quantify. Through synthesis of historic and current cost data, it provides a reasonably accurate forecast of the annual cost of meeting current shipboard AT/FP requirements. Although most of the data used in developing the model are specific to ships of the Atlantic Fleet (the Force Protection AEL applies to all naval vessels), the methodology employed in the formulation of the model is such that it is likely applicable to other U.S. Navy fleets as well.

V. CONCLUSIONS AND RECOMMENDATIONS

A. REVIEW OF RESEARCH QUESTIONS

1. Through Analysis of Limited Historical Data, Can a Shipboard AT/FP Cost Estimation Model be Developed?

The model developed by the researcher is as follows:

$$\text{AT/FP Cost} = \left(\begin{array}{c} \text{AT/FP TAD} \\ \text{and Travel} \\ \text{Costs} \end{array} \right) + \left(\begin{array}{c} \text{Port Visit} \\ \text{AT/FP} \\ \text{Costs} \end{array} \right) + \left(\begin{array}{c} \text{AT/FP Phased} \\ \text{Replacement} \\ \text{Costs} \end{array} \right) + \left(\begin{array}{c} \text{AT/FP} \\ \text{Incremental} \\ \text{Costs} \end{array} \right)$$

The model is designed to capture the major elements of shipboard Antiterrorism/Force Protection costs, and is based on analysis of limited existing cost data, as well as estimates developed by the Force Comptroller, Atlantic Surface Fleet. Results obtained indicate the annual cost that should be budgeted for ships of the Atlantic Fleet is approximately \$6 million. Through synthesis of historic and current cost data, it provides a reasonably accurate forecast of the annual cost of meeting current shipboard AT/FP requirements. Although most of the data used in developing the model is specific to ships of the Atlantic Fleet, the methodology employed in the formulation of the model is such that it is likely to be applicable to other U.S. Navy fleets as well.

2. Does Meeting AT/FP Funding Requirements Impact Ships Operations Funding in Other Areas?

The Type Commander is responsible for a considerable portion of the cost of providing shipboard AT/FP. He must budget for items such as the additional cost of port visits, repair parts and equipment maintenance supplies, TAD for training, and eventually, the phased replacement of equipment. As the TYCOM's AT/FP "bill" grows, funding for other things not AT/FP-related may be reduced, delayed, or even canceled. If care is not taken, whether these "other things" are QOL programs for Sailors or additional repair parts for a weapon system, footing the bill for increased Force Protection conditions may have the unintended consequence of adversely affecting the future readiness of our forces. Data regarding items not funded due specifically to funding AT/FP items instead are unavailable at the time of this writing, and is an area of suggested further research.

3. How Will Having a Better Grasp on Increasing Shipboard AT/FP Costs help Type Commanders in Their Budgeting Cycle?

The ability to accurately forecast and budget for funding requirements is essential to a Type Commander. He must be able to generate an accurate, detailed budget based upon the requirements of commanders under his cognizance, and perhaps just as importantly, be able to defend its contents to his superiors. As the cost of meeting shipboard AT/FP requirements grows, so will his concern about being able to fund it appropriately. Through the collection and analysis of specific AT/FP cost data, the TYCOM will be better equipped to formulate budgets which more accurately reflect the increasing nature of these costs, and be armed with more complete information to defend his budget when called upon to do so.

4. Do Shipboard AT/FP Requirement Costs Vary, and If So, Why?

Shipboard AT/FP requirement costs vary with several factors, including ship class, port visits, and home port. The class of ship determines which items of the Force Protection AEL it carries, as well as how many of those items it is authorized. This in turn will determine the phased replacement cost of these items. As illustrated in Table 4.3, the estimated annual phased replacement cost of AT/FP equipment for Atlantic Fleet CG-class ships is \$482,844, while that for MCM-class ships is \$160,276. While there are 14 ships of each class in the Atlantic Fleet, the amount and type of equipment they are each issued is quite different.

The ship class also determines the number of crewmembers required to undergo special Force Protection training, which in turn determines the level of TAD and travel funding required. Smaller classes such as MCM, MHC, and PC have smaller crews, and hence must send fewer crewmembers to attend this training. The reverse is true for larger classes such as LHA and LHD.

The number, duration, and geographic location of port visits also have a major impact on shipboard AT/FP costs. The port visits to Istanbul, Turkey described in Chapter IV (three single-ship visits for a total of six days inport, at a cost of \$122,900) are good examples of how inordinate the AT/FP service costs can be.

The ship's homeport will also affect the AT/FP costs it incurs. If the ship is not homeported near a training activity offering the special AT/FP training it requires, it must

expend more TAD and travel dollars than do ships that are. Additionally, Squadron Commanders who are not collocated with all of the ships under their cognizance will incur more of these costs than those who are, as they are required to certify the AT/FP proficiency of the ships under their command.

B. CONCLUSIONS

The cost of meeting Force Protection requirements is on the rise. As shipboard AT/FP costs increase, they become an element of greater concern to the Type Commander, who must attempt to forecast and budget for them. This thesis presents a viable shipboard AT/FP cost estimation model based upon historical and current data analysis. Costs captured by the model are AT/FP TAD and travel expenses, costs of AT/FP services during port visits, the phased replacement cost of AT/FP equipment, and any incremental costs incurred, but not included in the previous terms.

As forecasted by the model, the annual cost of meeting current shipboard AT/FP requirements for ships of the Atlantic Fleet is approximately \$6 million. Several factors may affect the costs predicted by the model, including changes in shipboard OPTEMPO, the number, duration, and geographic location of port visits, the number of ships per class, current FPCON, actual shipboard life of Force Protection AEL items and the rate of phased replacement, and inflation rates from one year to the next.

Use of the cost estimation model will help Type Commanders more accurately forecast and thus budget for these costs. Perhaps more importantly, it will help bring to light the importance of capturing the myriad costs associated with meeting shipboard AT/FP requirements in today's Force Protection environment.

C. RECOMMENDATIONS

1. Adopt the 3-Year Averaging Model When Sufficient Data Exists

The current ships operations funding model as presented in Chapter II utilizes a three-year weighted average to forecast funding requirements for the next fiscal year. Although this amount of historical cost data does not yet exist for shipboard AT/FP costs, aligning the shipboard Force Protection cost model with the ships operations funding

model currently in use when sufficient data become available may yield more accurate forecasts and serve to further streamline the ships operations funding process.

2. Re-emphasize the Importance of AT/FP Fund Code Use

To ensure the various AT/FP-related costs being incurred are being reported correctly, Type Commanders should consider periodically (perhaps quarterly) restating to ships, training activities, and maintenance activities the importance of utilizing the “L” fund code promulgated in September 2001. Stressing the appropriate use of this fund code to all subordinate commands will serve to reinforce its importance, accelerate its adoption, and help to ensure that accurate and complete AT/FP cost data are being captured.

3. Separate the AT/FP Fund Code Into More Discrete Levels

The promulgation and adoption of the AT/FP fund code will help to ensure AT/FP costs are being captured, but it may not be enough. As is, the Type Commander is unable to discern why a cost reported under the “L” fund code was incurred – for the purchase of equipment, repairs or maintenance, or for AT/FP services rendered. Further breaking down the code into more discrete levels may better serve Type Commanders in their efforts to discover where the truly significant AT/FP costs lie. Possible sub-categories include:

- The purchase of AT/FP equipment
- Repairs to equipment due to AT/FP-related use
- Services rendered, such as additional measures required during port visits
- AT/FP TAD, travel, and training

Although the promulgation and adoption by the fleet of additional fund codes presents its own challenges – training, existing system capacity, etc. – a finer breakdown of the nature of AT/FP costs incurred will assist analysts and those involved in budgeting in more accurately identifying where AT/FP dollars are being spent. This in turn will assist those involved to more accurately allocate funding where it is needed.

D. SUGGESTED AREA OF FURTHER RESEARCH

1. Unfunded Requirements as a Result of Paying the AT/FP “Bill”

As DON budgets rise and fall with the passage of time, it may be worthwhile to study what, if anything, is being unfunded or under-funded, due specifically to meeting AT/FP funding requirements. Should a sharp decline in funding occur, Navy leadership would be forced to make difficult decisions with regard to the allocation of suddenly scarce dollars.

2. The Ship Operations Funding Model Itself

The current ship operations funding model has been in use for about six years. A study to determine the accuracy of estimations made and whether or not costs forecasted by the model are truly indicative of those actually being incurred may help to shed light on the assumptions made about where dollars are needed, and where they should be allocated.

3. The Effect of AT/FP Requirements on Existing Ship’s Equipment

As the fleet meets increased AT/FP requirements, additional stress is placed on existing equipment. Small boats are logging additional operating hours, small arms being issued to watchstanders are undergoing heavier use, and some damage control equipment may be experiencing increased use. The cumulative effect of this increased use of equipment includes additional maintenance and repairs, which translates to additional dollars needed for maintenance supplies, repair parts and perhaps depot level repair. As such data become available, a study to quantify these effects may be beneficial.

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APPENDIX A. LIST OF ACRONYMS

AEL	Allowance Equipage List
AT/FP	Antiterrorism/Force Protection
BOS	Base Operations Support
CBR	Chemical, Biological, Radiological
CINCLANTFLT	Commander in Chief, U.S. Atlantic Fleet
CJCS	Chairman, Joint Chiefs of Staff
CNO	Chief of Naval Operations
CNRMA	Commander, Naval Region Mid-Atlantic
CNRNE	Commander, Naval Region Northeast
CNRSE	Commander, Naval Region Southeast
CNSL	Commander, Naval Surface Force, U.S. Atlantic Fleet
CNSP	Commander, Naval Surface Force, U.S. Pacific Fleet
COMNAVSEASYSOM	Commander, Naval Sea Systems Command
COMNAVSURFOR	Commander, Naval Surface Forces
CRAFT	Cost Reporting, Analysis, and Forecasting Tool
CRUDES	Cruiser-Destroyer
DOD	Department of Defense
DON	Department of the Navy
FPCON	Force Protection Condition
FY	Fiscal Year
GAO	General Accounting Office
GAO/NSIAD	General Accounting Office/National Security and International Affairs Division

JCS	Joint Chiefs of Staff
LANTFLT	Atlantic Fleet
MEDEVAC	Medical Evacuation
MTIS	Material Turned-in to Stores
NCIS	Naval Criminal Investigative Service
NRCC	Naval Region Contracting Center
NRF	Naval Reserve Force
O&M	Operations and Maintenance
OPN	Other Procurement, Navy
OPTAR	Operating Target
OPTEMPO	Operations Tempo
OSD	Office of the Secretary of Defense
PPBS	Planning, Programming, and Budgeting System
QOL	Quality of Life
R&D	Research and Development
RHIB	Rigid Hull Inflatable Boat
SECDEF	Secretary of Defense
TAD	Temporary Assigned Duty
TYCOM	Type Commander
USCG	United States Coast Guard

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